

Claims

Claims 1-8 inclusive: *Canceled*

9. *(Currently amended)* A magnetic recording disk comprising:
a substrate; and
an antiferromagnetically-coupled (AFC) magnetic recording layer structure on the
substrate and having two remanent magnetic states in the absence of an applied magnetic
field, the AFC recording layer structure comprising
(a) a first lower ferromagnetic layer having a remanent magnetization Mr, a thickness t
and a remanent-magnetization-thickness product Mrt; (b) a first antiferromagnetically
coupling layer on the first lower ferromagnetic layer; (c) a second lower ferromagnetic layer
on the first antiferromagnetically coupling layer and having an Mrt less than the Mrt of the
first lower ferromagnetic layer; (d) a second antiferromagnetically coupling layer on the
second lower ferromagnetic layer; (e) a third lower ferromagnetic layer on the second
antiferromagnetically coupling layer and having an Mrt greater than the Mrt of the second
lower ferromagnetic layer; (f) a third antiferromagnetically coupling layer on the third lower
ferromagnetic layer; and (g) an upper ferromagnetic layer on the third antiferromagnetically
coupling layer and having an Mrt greater than the sum of the Mrt values of the first and third
lower ferromagnetic layers;
and wherein the magnetization directions of the upper ferromagnetic layer and the
third ferromagnetic layer are substantially antiparallel in each remanent state, the
magnetization directions of the second lower ferromagnetic layer and the first ferromagnetic
layer are substantially antiparallel in each remanent state, and the magnetization direction of

the upper ferromagnetic layer in one remanent state is substantially antiparallel to its magnetization direction in the other remanent state.

10. *(Original)* The disk of claim 9 wherein the lower ferromagnetic layers are formed of substantially the same material, and wherein the second ferromagnetic layer has a thickness less than the thickness of each of the first and third lower ferromagnetic layers.

11. *(Original)* The disk of claim 9 wherein the upper ferromagnetic layer is an alloy comprising Co, Pt, Cr and B, and wherein each of the lower ferromagnetic layers is an alloy comprising Co and Cr.

12. *(Original)* The disk of claim 11 wherein each of the lower ferromagnetic layers is an alloy further comprising Ta.

13. *(Original)* The disk of claim 9 wherein each of the antiferromagnetically coupling layers a material selected from the group consisting of ruthenium (Ru), chromium (Cr), rhodium (Rh), iridium (Ir), copper (Cu), and their alloys.

14. *(Currently amended)* The disk of claim 9 further comprising an underlayer located on the substrate between the substrate and the AFC recording layer structure.

15. *(Original)* The disk of claim 9 further comprising a protective overcoat formed over the upper ferromagnetic layer.